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In the Christiana *Videnskabs-Selskabs Vorkandlinger* for 1902 and 1903 (the last volume being published from the Fridtjof Nansen fund) Dr. Robert Collett gives additional records of additions to the fish fauna of Norway. These admirable notes are of great value to the student of the fishes of Northern Europe, as well as of Northern regions generally.

Jordan and Starks continue in the *Proceedings of the U. S. National Museum* (XXVII, 1904) their monographic accounts of the fishes of Japan.

In the review of the Scorpenidæ 52 species are described as Japanese, 14 of these being new. These are arranged in 23 genera, the following being new: *Thysanichthys*, *Sebastiscus*, *Lythrichthys*, *Ebosia*, *Decterias*, *Inimicus*, *Ocosia*, *Erisphex*. The new species and most of the new genera are figured.

The Cottidæ of Japan are also described in detail by the same authors. In these fishes as in the Scorpenidæ, of which the Cottidæ are the Arctic descendants, the waters are particularly rich. Fifty-seven species are described, 19 being new. These are arranged in 40 genera, the new genera being *Stlengis*, *Schmidtia*, later called *Schmidtina*, the name *Schmidtia* being preoccupied. *Daruma*, *Ricuzenius*, *Rheopresbe*, *Ainocottus*, *Crossias*, *Elaphichthys*, *Alcichthys*, *Furcina*, *Ocynectes*, *Bero*, *Vellitor*.

Similar reviews cover the less numerous species of the families of Agonidæ and Hexagrammidæ.

The two species of white Chimæra (*Chimera phantasma* and *Chimera mitsukurii*) found in Japanese waters are described and figured by Jordan and Snyder.

D. S. J.

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## PALÆONTOLOGY.

**Eastman's Translation of Zittel, Vol. II.**<sup>1</sup>—Since the publication of the first volume of Dr. Eastman's translation of Zittel's *Grundzüge der Palæontologie*, English speaking students have awaited with keen interest the appearance of the second volume, and it may

<sup>1</sup> von Zittel, Karl A. *Text-Book of Palæontology*, Vol. II. Translated and edited by Charles R. Eastman. London and New York, Macmillan, 1902. Svo, 283 pp., 373 figs.

be said that the latter fully maintains the high standard set in the earlier portion of the work. The present volume treats of the Vertebrates, with the exception of the mammalia, to the consideration of which class the third and last volume will be devoted.

The general method of treatment which has made Zittel's works so valuable to the student happily has been closely adhered to in the translation; we refer especially to the introductory sections on the various classes, and to the brief diagnosis in italics with which the consideration of each group,—class, sub-class, order and family,—is introduced. It is largely to this latter feature that these works owe their superiority as books for ready reference.

In comparing the English edition with the original we note first very considerable amplification and revision, representing the advance in Palæozoölogy during the seven years since the publication of the earlier work, and in this enlargement and revision Dr. Eastman has had the collaboration not only of the author but of a number of competent English and American specialists. As regards Taxonomy the changes from the original have been very slight, far less indeed than we had hoped to see, and it is to be regretted that the editor and his collaborators so far subordinated their own views on classification to those of the author, since some rearrangement, especially of the fishes and reptiles, was quite desirable.

The entire section on fishes has been translated and revised by Dr. Arthur Smith Woodward of the British Museum. Dr. Woodward has been rather conservative in the matter of revision and has kept his own opinions on taxonomic points very much in the background. Of this section the part on ostracoderms has undergone the most extensive revision, chiefly based on the recent researches of Traquair. Thus we find Traquair's order Anaspida included, and in all nine families of ostracoderms are recognized. The Arthrodira, which in the original were given ordinal rank among ostracoderms, are now very properly placed as a sub-class, but the Macropetalichthyds—the Anarthrodira of Dean—are ranked *incertæ sedis*. It is rather to be regretted that the old division of the bony fishes into Ganoidei and Teleostei has been adhered to, instead of the better morphological differentiation of Crossopterygia and Actinopterygia. The old system has, however, the merit of familiarity and convenience. The section on ganoids has been amplified about one half and has been thoroughly revised. Little is said regarding the systematic position of the Dipnoi, but we can scarcely approve of their place in the book, in immediate sequence to the Arthrodires; it suggests tacitly the former supposed relationship of the two groups.

The section on Amphibia, revised by Dr. E. C. Case, differs but little from the original, except in the added descriptions of several genera. The taxonomic system is unaltered and, on the whole, is quite satisfactory, but it must be conceded that the Phyllospondyli of Zittel (the Branchiosauria) do not form a group coördinate with Lepospondyli, and there is much to be said in favor of comprising the Branchiosauria, Microsauria, and Aistopoda as sub-orders of the order Lepospondyli.

The treatment of the reptiles, in which the editor had the collaboration of H. F. Osborn, S. W. Williston, J. B. Hatcher and O. P. Hay, occupies nearly one half of the book, and is admirable in details, such as the descriptions of smaller groups, but the taxonomic arrangement shows nothing of the relationships of the various orders which compose the class. It is regrettable that the revision of this section was completed before the appearance of recent papers by R. Broom, H. F. Osborn and others, which show in a convincing manner that the reptiles have had a diphyletic evolution. Some of these papers have considerably amplified our knowledge of the Anomodontia and have indicated that the Parasuchia constitute an order quite distinct from the Crocodilia.

To Mr. F. A. Lucas is due the credit for the enlargement and thorough revision of the section on birds. This part has been almost entirely re-written, and a different taxonomic scheme, based chiefly on Stejneger's classification, has been adopted, to the marked improvement of the book, although, as Mr. Lucas explains, it is not possible in the case of birds to do more than group related forms, and quite out of the question to arrange the groups so as to indicate phyletic relationships.

It will be noted that the points here criticised are all points of classification, points on which the editor and his collaborators were not entirely free to express their personal views. The translation and revision have been excellently done, and we may say that Dr. Eastman has given us in the present volume the most useful textbook published on the Palæontology of the vertebrates below mammals. We trust that the volume on mammals may be as good.

J. H. McG.